Team Name: TrafficNet
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Project Name: Road Scene Understanding

Project Description:
With the enrichment of autonomous driving databases, deep learning methods have become more and more popular in autonomous driving, and among all the tasks, road detection and understanding are one of the most essential ones. In this project, we intend to implement a deep-learning-based approach to achieve end-to-end road detection and segmentation on real images captured by driving recorders. We hope to be able to achieve the following tasks in this project: (1) road detection and segmentation (2) traffic light detection (3) pedestrian detection, and (4) vehicle detection on public datasets such as KITTI, Bosch, or CamVid. Tentative approaches include SegNet, UNet, and IIC.

Project Demonstration:
In the demonstration video, We will first explain what our model is and how it works. Then, we will show our model's detection and segmentation results over input images with a variety of backgrounds. Specifically, the result regions will be displayed as overlays over the input images as shown in **Figure 1**. We will also display our model's performance statistics over a testset of road images which are frames of driving recorder videos taken in real-life.

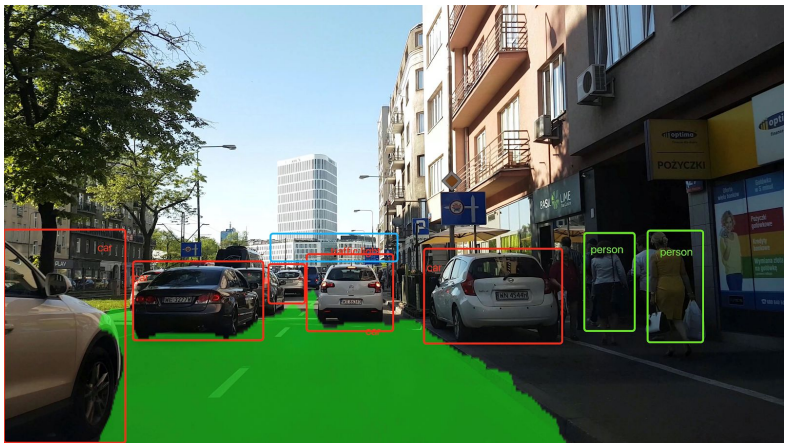

Figure 1: Road segmentation and car/traffic light/pedestrian detection from a real life road image[1]

Social Impact:
Currently, a core problem of autonomous driving is the detection of different components such as passengers, lane marks, and traffic lights, in real driving scenarios. Our model intends to help tackle part of this core problem. Knowledge about specific locations of traffic lights from a car-mounted camera can provide the groundwork for safer self-driving vehicles.

For human drivers, a lot of hazards arise when traffic lights are not spotted in complicated scenes. Our model can also be provided to human drivers to improve their awareness of traffic lights locations in dim environments or complicated situations.

[1] Image from https://medium.com/@karol_majek/self-driving-car-road-segmentation-514ae80e103a